REMARKS

With the cancellation of claims 13 and 15, claims 1-12, 14, and 16-17 are pending. Claims 1, 9, 10, 14, and 16 have been amended. These amendments are supported at least by the specification in page 40, lines 23-26; page 41, line 14 to page 42, line 1; page 12, lines 6-18; page 14, lines 9-16; page 5, lines 15-16. Claims 3 and 4-8 have been amended for editorial purposes without any narrowing on the scopes of the claims. The amendment to claim 4 is supported at least by the specification in page 6, lines 14-17. Applicants respectfully submit that no new matter has been introduced.

Rejections of claims 1 and 3-15

Applicants respectfully traverse rejections of claims 1 and 3-15 as allegedly being anticipated by under 35 U.S.C. 102(b) or, in the alternative, under 35 U.S.C. 103(a) as obvious over Andrews (WO 01/71839; US 2004/0020764).

Claim 1 has been amended to recite an electrolyte membrane-electrode assembly comprising a pair of electrodes and a hydrocarbon-based solid polymer electrolyte membrane sandwiched between and joined with the electrodes ... wherein the glass transition temperature of the electrolyte membrane in a dry state is not lower than 160°C and the maximum water content (Wm) of the electrolyte membrane is within the range of from 10% to 45% or 70 to 120%.

Andrews fails to teach or suggest an electrolyte membrane-electrode assembly comprising a hydrocarbon-based solid polymer electrolyte membrane, the maximum water content (Wm) of which is within the range of from 10% to 45% or 70 to 120%, let alone joining such an electrolyte membrane with the electrodes, as recited in current claim 1. In addition, Andrews is silent on the maximum water content (Wm) of the electrolyte membrane. Furthermore, Andrew merely discloses "associating a catalyst material and/or electrode with an ion-conducting membrane" (paragraph [0144]), instead of

joining an electrode with a hydrocarbon-based solid polymer electrolyte, as recited in present claim 1.

At the time of the invention, it had been difficult to join a hydrocarbon-based solid electrolyte membrane having a glass transition temperature in a dry state not lower than 160°C and a maximum water content within the range of from 10% to 45% or 70 to 120% with electrodes by conventional hot pressing. Problems such as deformation, degradation, and lower durability of the electrolyte membrane often resulted from the conventional methods. See specification, page 12, line 19 to page 13, line 15. Based on the disclosure of Andrews, there would have been no reasonable expectation of success to make the claimed invention by joining a hydrocarbon-based solid polymer electrolyte membrane with electrodes wherein the glass transition temperature of the electrolyte membrane in a dry state is not lower than 160°C and the maximum water content (Wm) of the electrolyte membrane is within the range of from 10% to 45% or 70 to 120%.

By contrast, applicants have provided a method of forming a favorable joint between electrodes and a hydrocarbon-based solid electrolyte membrane having the specific glass transition temperature in a dry state and maximum water content, as recited in claim 1. For example, in certain embodiments of the instant invention, the hydrocarbon-based solid electrolyte membrane is joined with the electrodes while the content of water in the electrolyte membrane is within the range of 10% to 70% of the maximum water content of the electrolyte membrane. See specification, page 53, lines 13-20. With this method, electrolyte membrane-electrode assemblies with improved durability, reliability and reproducibility can be obtained.

For at least the forgoing reasons, claims 1 and 3-15 are not anticipated or rendered obvious by Andrews. Withdrawal of the rejections is respectfully requested.

Rejection of claim 2

Applicants respectfully traverse the obviousness rejection of claim 2 over Andrews (WO 01/71839; US 2004/0020764), as applied to claim 1, and further in view of Inoue et al. (US 2001/0044042) under 35 U.S.C. 103(a).

The deficiencies of Andrews discussed above for claims 1 and 3-15 also apply to claim 2. The deficiencies are not cured by Inoue at least because Inoue does not teach or suggest an electrolyte membrane-electrode assembly comprising a hydrocarbon-based solid polymer electrolyte membrane having a maximum water content (Wm) within the range of from 10% to 45% or 70 to 120%, let alone joining such an electrolyte membrane with the electrodes, as recited in claim 1. Therefore, the claimed invention would not have been obvious over Andrews in view of Inoue. Withdrawal of the rejection is respectfully requested.

CONCLUSION

The Examiner is encouraged to contact the undersigned regarding any questions concerning this amendment. In the event that the filing of this paper is deemed not timely, applicants petition for an appropriate extension of time. The Commissioner is authorized to debit Deposit Account No. 11-0600 the petition fee and any other fees that may be required in relation to this paper.

Respectfully submitted,

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